

# Combustion Synthesis of Europium doped fluorescent Nanoparticles

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Europium doped nanophosphors have wide applications in developing optical switch, high density optical memory, and biomedical tagging for genes and chromosomes.

The Eu doped  $Y_2O_3$  and  $SiO_2$  nanoparticles are synthesized using the oxygen rich flames. The luminescence intensity and particle size uniformity are analyzed. Our research demonstrated that the present method significantly extend the fluorescence intensity and quenching limit.



Fig.1 Top: Synthesized Eu doped  $Y_2O_3$  nanoparticles.  
Bottom: Fluorescence of particles under UV excitation.

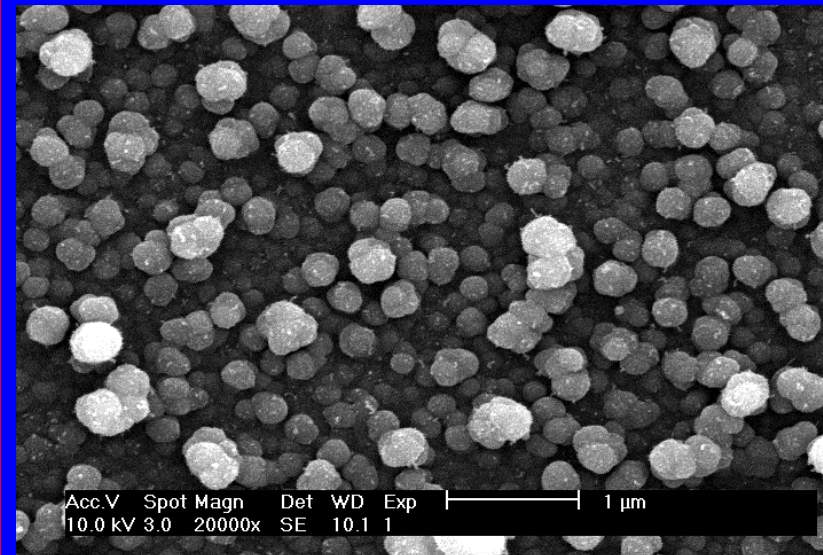


Fig.2 SEM image of the Eu doped  $Y_2O_3$  nanoparticles synthesized using oxygen rich combustion.

# High School Students get Lab Experiences

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The project involves collaborations between Princeton Material Institute, Department of Chemistry, and Department of Mechanical and Aerospace Engineering. One undergraduate student is involved in the researches involving the advanced diagnostic instruments such as TEM, SEM, and fluorescent spectrometers. The program also supports the PI to work with the Princeton University Materials Academy (PUMA) to create education modules for *Upward Bound* students of Trenton High School in New Jersey. The goal of the education program is to encourage the hands-on scientific experimentation and to lead minority students in the direction of science careers.

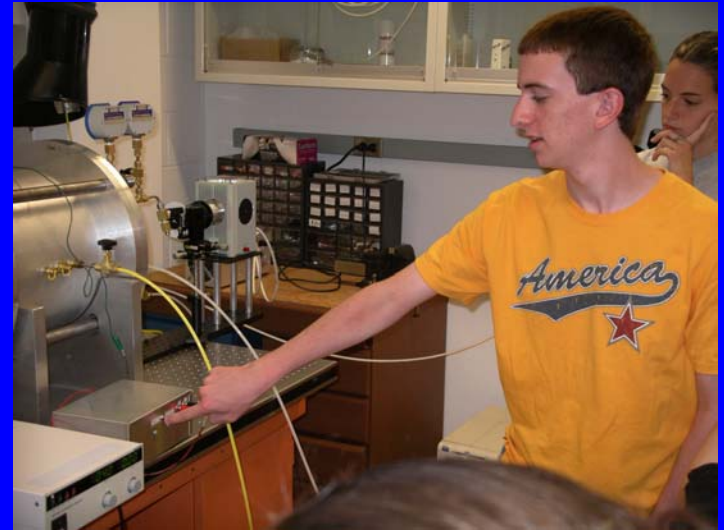


Fig.3 High school students are doing experiments of combustion at low and elevated pressures.



Fig.4 Graduate students are explaining combustion synthesis to high school students of Trenton